appendix 4: transportation analysis

Plan Context and Initiatives

The public hearing draft of the Kensington Sector Plan proposes to move the Town from a primarily auto-oriented suburban area to a more walkable, mixed-use community that takes full advantage of the existing MARC station and the Town's proximity to both segments of the Metrorail Red Line. This Appendix provides the technical basis and details for the transportation system recommendations in the Kensington Sector Plan.

The Plan proposes several initiatives to promote connectivity, mobility, and access in a context that recognizes the Town's unique history, scale, location, and desire to redevelop in certain areas.

Examples of proposed initiatives include:

- lower target speeds on selected roadways
- buffers between the roadway and pedestrian and bicycle paths
- an effort to "fill-in" the grid and introduce operational enhancements instead of widening roads
- introduction of striping and lighting that focuses on pedestrian and bicyclist needs
- provision of additional ways for pedestrians to safely cross Connecticut Avenue and the railroad tracks, in particular.

Since the early 1980s, the balance between land use and transportation system recommendations in master and sector plans has applied the procedures and general policies contained in the County's Growth Policy. The current Growth Policy applies an area wide measure of mobility, Policy Area Mobility Review (PAMR), and a localized measure of congestion, Local Area Transportation Review (LATR). These measures, used to define adequacy for development review cases, are adapted for master plan analysis through the Planning Department's TRAVEL/3 regional travel demand model and Local Area Model as described in Chapter 3 of this Appendix.

Land use and the transportation system are balanced to promote an end-state level of development that provides the zoning density to support the redevelopment of Kensington in a way that is consistent with the community's goal of moving from an auto-oriented community to a more mixed-use community with improved access to transit and more opportunities for residents and visitors to walk and bike instead of drive—a significant challenge given the Town's crossroads location.

This Appendix reviews two primary areas of focus related to the draft Plan:

- the recommendations at a greater level of detail than described in the draft Plan.
- additional detail on the technical analysis and demonstrates that the recommended end-state conditions will result in an appropriate balance between land use and transportation.

Sector Plan Recommendations

Table 4 shows the range of transportation system strategies examined in the Kensington Sector Plan, including:

- travel demand management
- transit services
- sector plan street network
- bikeway network
- transportation system policies.

Table 4 also indicates the likelihood that the Plan would incorporate the different strategies based on analyses and coordination performed to date. The shaded cells indicate strategies with the highest overall potential. In general, those strategies were incorporated into the Plan as described.

Table 4 Transportation Management Strategies

	Strategy	Opportunities	Constraints	Potential
Demand Management	Increase parking management, consolidate some parking into a single centrally located structure	Reduce traffic, provide revenue, integrate with private development	Parking management authority establishment, incentive coordination, garage location	High
	Reduce single occupant vehicle mode share	Flexible, low capital cost	Operational costs, monitoring	Moderate
Transit Services	Construct BRT or other enhanced service through Plan area	Provide faster connections for Kensington with Metro Red Line Corridors	Capital costs, operational costs, and right of way for full BRT option	Low
	Express bus service	Capture long-distance riders	Operating cost	Low
Local Street Network	Add selected street connections	Provide alternate route, reduce walking distances, access management	Capital costs, definition of final alignment and implementation responsibility	Moderate
	Left turn prohibitions	Reduce congestion	Requires grid, implementation of connection of Summit Avenue, circuitous trips (cars and buses), public acceptance	Moderate
	Add turn lanes	Reduce congestion	Increase pedestrian crossing distances, capital cost	Moderate, but not recommended
Polices	Increase residential uses	Create mixed use centers, provide housing near jobs, lower trip generation rates	Economic and market feasibility	High
	Accept higher congestion levels	Consistent with urbanizing area, no capital cost	Customer costs, public acceptance	Low

Travel Demand Management

Travel Demand Management (TDM) describes a wide range of programs and services designed to reduce the use of single-occupant vehicle trips. TDM is the set of public policy strategies to provide travel options that reduce and spread demand by travel destination, mode, route, and time of day to most efficiently use transportation system infrastructure and resources. TDM strategies can be implemented by both public and private sector activities.

TDM strategies include:

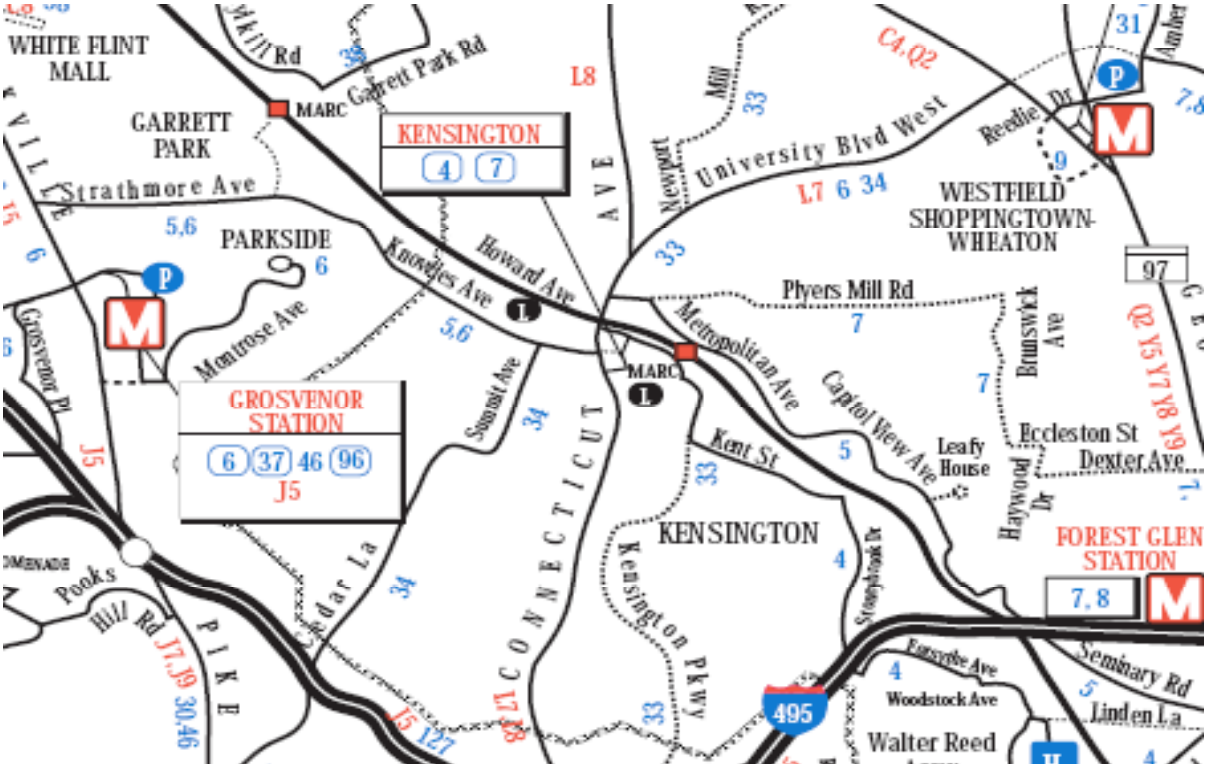
- Infrastructure such as high quality pedestrian environments, bus or high occupancy vehicle (HOV) facilities or preferential treatments, telework centers, commuter information stores/ kiosks, car-sharing (i.e., Zipcar) and bike-sharing stations, and well-located transit stations or stops with real-time transit information.

- Services such as transit information services, car/vanpools, ride-sharing/matching, guaranteed ride home services, preferential parking, and alternative commute option information (e.g., the Metropolitan Washington Council of Government Commuter Connections and their commuter connections website as well as other private vendors).Policies that affect when and to what extent people use the infrastructure and services, including parking supply management, preferential parking treatments for carpools/vanpools, transit subsidies, flexible work schedules, tax incentives, congestion pricing, and distance-based or vehicle miles of travel pricing.

Kensington's lack of a non-retail commercial job density makes applying some TDM strategies difficult. However, one targeted opportunity for Kensington would be consolidating parking into one or two centrally located structures to allow for more efficient use of scarce land in the town center that is close to transit. Actively managing the spaces through price and timing controls ensures that equitable use can be preserved. Further, the pricing aspect can be an effective tool to discourage solo travel by car during certain peak time periods.

The block bounded by Connecticut Avenue, Knowles Avenue, and Detrick Avenue would be appropriate and suitable for consolidated parking, with the opportunity to line the parking structure on the east and south sides with building space to be served by the parking.

Map 5 Existing Bus Service



Transit Service

Existing Bus Service

The Town of Kensington is served by six Ride On routes and two Metrobus routes. The Ride On routes are generally designed to connect neighborhoods with nearby Metrorail and MARC stations while the Metrobus service is focused on Connecticut Avenue.

During weekday peak periods, the frequency of service varies from 10 to 30 minutes for the Ride On routes and 20 to 30 minutes for the Metrobus routes. The most frequent service (every 10 minutes) is provided by Ride On Route 5 and is oriented toward White Flint in the morning—a 10 minute trip . In the afternoon peak period, the most frequent service (every 10 to 12 minutes) is to Silver Spring—an 18 minute trip. Frequent service (every 15 minutes) is also provided on Ride On Route 34 between Wheaton and Friendship Heights via Kensington and the Medical Center and Bethesda Stations. A shorter version of this route could potentially provide an even better connection to the Red Line (see discussion below).

Ride On Strategic Plan

The current Ride On Strategic Plan does not include any significant enhancements to service in the immediate Kensington area. Veirs Mill Road (from Rockville to Wheaton) and University Boulevard (from Wheaton to Langley Park) are identified as high priority corridors for implementing bus rapid transit (BRT) service.

Kensington is situated between the western and eastern segments of the Metrorail Red Line. In general, there is, and will continue to be a need to provide transit through the area that connects the two segments of the Red Line. It is closest to the Red Line stations where "turnbacks" take place—at Grosvenor and Silver Spring. In the weekday peak periods, there is a higher level of service at these two stations and at stations to the south. As for bus travel time, the closest stations are Wheaton on the eastern leg of the Red Line and either Grosvenor or Medical Center on the western leg. Future Ride On route planning should consider the feasibility of operating limited stop frequent (at least 15 minute) peak period service directly between Wheaton and (as an example) Medical Center or Grosvenor via Kensington over the same (but shorter) alignment as Route 34 or Route 6.

Staff considered the potential for BRT within the Plan area but does not believe it would offer any significant advantage—especially given the potential impacts related to right-of-way constraints. The area is more suitable for a streetcar application but any formal consideration of a potential streetcar should be subject to more detailed analysis than can be implemented in this Plan.

MARC Commuter Rail Service Growth and Investment Plan (September 2007)

MARC runs six weekday morning and eight afternoon trains that stop at the Kensington station. On an average weekday, a total of 120 passengers board these trains at Kensington.

The MARC plan calls for expanding the parking lot at the Kensington station sometime around 2020. A recent MTA survey of the parking lot noted 60 vehicles—16 of which were registered to a Kensington address. The survey showed eight vehicles registered in Silver Spring and six in Gaithersburg, and 30 elsewhere. There are officially a total of 53 parking spaces at the Kensington MARC station so demand exceeds supply. Expanded parking at other MARC stations might free up spaces for local commuters.

There is no question that the MARC station and planned enhancements to MARC service and facilities are key components of an overall network that will help reduce the rate of travel by single-occupant vehicles and help spur transit-oriented development. MARC and the Town should also work with CSX to provide a pedestrian underpass at the train station as part of any improvement program. A continued visible commitment to improving all aspects of the MARC infrastructure and service is critical to attaining the Town's full redevelopment potential.

The Sector Plan should also recognize that the primary function of commuter rail service is to provide long distance access to activity centers. As a result, MARC's role in increasing non-auto mode share is more accurately viewed as complementary to other non-auto modes and not the dominant non-auto mode. The most effective way to increase transit mode share is to combine enhanced MARC service and infrastructure with improved pedestrian and bicycle connectivity to all types of transit. Particular emphasis should be placed on providing frequent direct bus access to Metrorail and the National Naval Medical Center/NIH complex.

While the Sector Plan does not recommend introducing BRT as a major component of the transportation system within the Kensington Plan area, it should be noted that the County is currently initiating a County wide study of the feasibility of a BRT network. One priority corridor for BRT design and technology is the Veirs Mill Road corridor near the plan area. This Kensington Plan encourages the development of pedestrian, bicycle, and transit facilities that improve the ability to connect with the BRT network.

Transit Supportive Density Considerations

There is a considerable amount of existing and evolving research on station area densities, pedestrian accessibility and connectivity, transit mode share, and other issues related to transit-oriented development. The Planning Department has reviewed available current material on this issue that includes Figure 3 as an illustration of development in the CR Zone with FARs up to 2.0 proposed for the Kensington town center.

Table 5 Characteristics of Mixed-Use, Transit-Oriented Development

		Net Density	Characteristics	Construction Type	Parking Configuration	
Mid-Rise Residential Over Commercial	MIXED USE TYPES	40-90 du/acre	3-6 stories with apartments, single- or double-loaded corridors with lobby entrance, off-street parking in structure or below grade	Type I/III (max 6 stories with building code modification/65 feet)	Groundfloor podium/ subgrade or elevated structure	
High-Rise Residential Over Commercial	MIXED USE TYPES	60+ du/acre	7+ stories, usually with base and point tower, single- or double-loaded corridors with lobby entrance, off-street parking in structure or below grade	Type I/II (max 12 stories/120 feet/no limits on Type 1)	Off-street parking in structure or below grade	
Low-Rise Office/Commercial	EMPLOYMENT TYPES	0.5-2.5 FAR	1-3 stories with lobby entrance to upper floors; retail, office or mixed-use with mix of tenant types, including limited large-footprint retail uses; parking in surface lots or structures	Type III/IV/V (max 4 stories/65 feet)	Off-street parking in groundfloor podium or surface	
Mid-Rise Office/Commercial	EMPLOYMENT TYPES	2.0-5.0 FAR	3-7 stories, with lobby entrance to upper floors, office with potential groundfloor retail, parking in structure or below grade	Type I/II (max 12 stories/160 feet)	Off-street parking in structure or below grade	
High-Rise Office/Commercial	EMPLOYMENT TYPES	4.0+ FAR	6+ stories with lobby entrance to upper floors sometimes with point tower over base, office with potential groundfloor retail, parking in structure or below grade	Type 1 (no limits)	Off-street parking in structure or below grade	
Institutional/Other Employment	EMPLOYMENT TYPES	varies	schools, civic uses, stadiums, hospitals, other entertainment uses; range of densities and sizes; parking often in structures or below grade	Varies	Parking often in structures or below grade	

Source: Station Area Planning, Reconnecting America and the Center for Transit-Oriented Development, February 2008, page 13.

The Plan envisions the Town Center as a denser more mixed use activity center than it is today. Floor area ratios (FAR) ranging from 1.0 to 2.0 in the Town Center would encourage redevelopment and provide for a higher degree of pedestrian access to both the MARC station and more frequent bus service. It will be important to support the higher densities with improvements to pedestrian connectivity and access as well as enhancements to the street grid that provide drivers with alternative routes for moving both within and through Kensington.

Master Planned Street Network

The Kensington Sector Plan recommends a street network that includes major highways, arterials, business streets, and primary residential streets. Section 49-31 of the County Code defines the functional classification system for roadways, including:

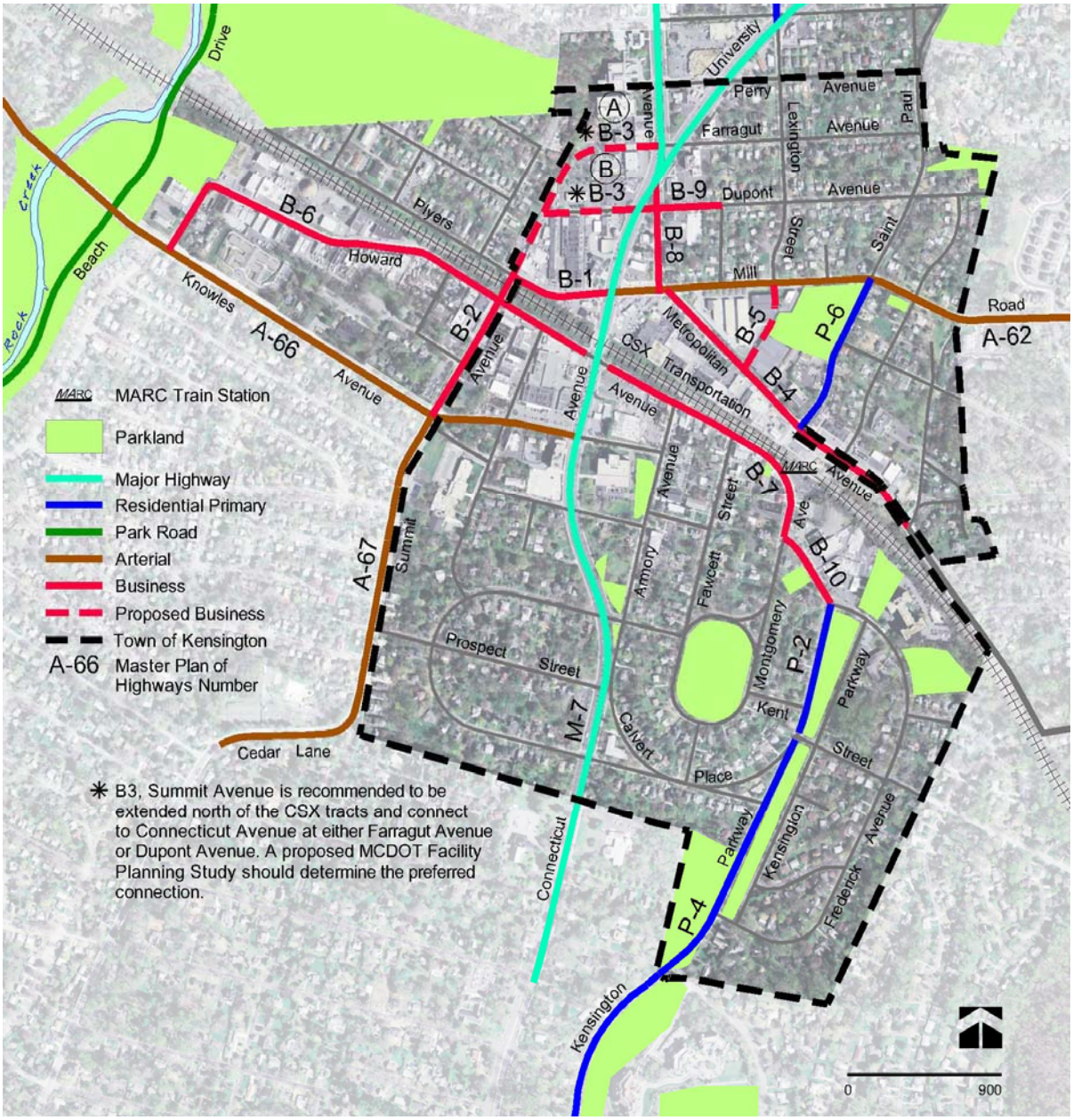
- A Major Highway is a road meant nearly exclusively for through movement of vehicles at a moderate speed. Access must be primarily from grade-separated interchanges and at-grade intersections with public roads, although driveway access is acceptable in urban and denser suburban settings [subject to approval by the Maryland State Highway Administration, Engineering Access Permits Division].
- An Arterial is a road meant primarily for through movement of vehicles at a moderate speed, although some access to abutting property is expected.
- A Business District Street is a road meant for circulation in commercial and mixed-use zones.
- A Primary Residential Street is a road meant primarily for circulation in residential zones, although some through traffic is expected.

- The proposed Kensington Sector Plan takes into consideration the County's Road Code (Chapter 49) developed in 2006 and its design standards (Executive Regulation 31-08) developed in 2007 and 2008. The design standards provide context-sensitive solutions—street designs that reflect and complement the planned adjacent land uses with standards appropriate for rural, suburban, and urban areas

The Town of Kensington, however, has jurisdiction over its own roadways independent of the County. This Plan recommends roadway design based on the County standards for uniformity and continuity. It applies the narrower urban cross sections and lower target speeds from the County's Road Code, which are more consistent with the context and town character of Kensington—both now and in the future.

The business street system is intended to be a slow-speed (30 mile per hour target speed or lower) environment consistent with other aspects of both the public and private realms designed to reinforce pedestrian scale and connectivity. Particular emphasis should be placed on curb extensions at crosswalks to further reduce pedestrian exposure to vehicular traffic and on pedestrian activated signals in appropriate mid-block locations that improve connections to high density land uses and give priority to pedestrian safety and flow. As a rule, MCDOT does not use mid-block pedestrian crossings, but they should be considered here.

Map 6 Kensington Street Network



The Plan's key recommendations for the street network are summarized below.

Connecticut Avenue

Connecticut Avenue (MD 185) is the primary north-south roadway in the Plan area. The average annual daily traffic is around 56,000 vehicles. There are three travel lanes in each direction. Left turns lanes are provided at each major intersection. South of the railroad tracks, the existing right-of-way varies between 95 and 105 feet. North of the railroad tracks, the right-of-way is wider and varies between 100 and 130 feet. According to the 2009 Highway Mobility Report, Connecticut Avenue's intersection with Plyers Mill Road is the fourth most congested intersection in the County with a critical lane volume (CLV) of 1,825 during the evening peak hour.

The CLV standard for the Kensington/Wheaton Policy Area is 1,600, so the existing volume is 114 percent of the standard. The congestion is due in large part to the heavy volume of northbound vehicles on Connecticut Avenue during the evening peak hour. Virtually all northeast to southwest traffic (either within or traveling through Kensington) must pass through this intersection. The lack of alternative routing creates a chokepoint in the heart of the Town.

The Plan recommends that the congestion at the intersection be addressed by:

- enhancing the grid to provide north-south options and thereby disperse traffic
- studying (and introducing) signalization that will improve pedestrian and pedestrian access and mobility
- considering operational improvements such as dynamic lane assignment and expansion of turn prohibitions.

The LATR analysis conducted for the Kensington Sector Plan indicates a year 2030 CLV for the Plan's proposed 2030 land use of 1,937 at the intersection with Plyers Mill Road, if Summit Avenue were extended (as discussed below) and improved to accommodate a dedicated left turn from Plyers Mill Road onto Connecticut Avenue northbound. This resulting CLV is still above the existing LATR standard of 1,600. The congestion would be worse if Summit Avenue were not extended.

This congestion could be further mitigated with dynamic lane assignment during the weekday evening peak hour. The staff's initial review of the impact of converting the southbound through lane on Connecticut Avenue to an eastbound left turn lane suggests than this operational improvement offers the potential to further reduce the CLV to 1,707 or slightly above the current 1,600 standard. This reduction is accomplished by reducing the time for the southbound left turn phase from Connecticut Avenue to eastbound Plyers Mill Road and allocating additional time to northbound Connecticut Avenue traffic.

Connecticut Avenue's intersection with Knowles Avenue is nearing the congested standard in the morning with a CLV of 1,433. A similar morning peak hour CLV of 1,335 has been recorded for the intersection with University Boulevard.

A December 2008 Maryland State Highway Administration (SHA) study generally confirmed these traffic conditions while also noting:

- The primary traffic flow contributing to congestion is the eastbound lane via Knowles Avenue to northbound Connecticut Avenue in the evening peak period.

- The intersection of Connecticut Avenue and Knowles Avenue operates at an acceptable level because of the triple left turn lanes onto northbound Connecticut Avenue—and is one reason few drivers use Summit Avenue to go northbound on Connecticut Avenue in the weekday evening peak hour.

- The limited left turn storage available on Plyers Mill Road (eastbound to northbound Connecticut Avenue), along with the two lane railroad bridge on Summit Avenue causes additional traffic to use Knowles Avenue to reach Connecticut Avenue and then travel northbound (in the evening) through the intersection of Connecticut Avenue and Plyers Mills Road.

The Plan therefore recommends the following improvements to Connecticut Avenue.

- Provide a minimum 120-foot right-of-way to accommodate three travel lanes, on-road bike lanes, a planted median where a dedicated storage for vehicles turning left from Connecticut Avenue isn't needed, and minimum five-foot wide landscape panels to separate the sidewalk from the travel/bike lane.

- Mitigate the congestion at Plyers Mill Road by extending Summit Avenue to Farragut Avenue (see discussion below). A study of its feasibility and design would be required before implementation.

- Examine the feasibility of introducing dynamic lane assignment at the intersection with Plyers Mill Road through an SHA study.
- Provide a sidewalk along the west side of Connecticut Avenue south of Washington Street.
- Provide an eight-foot wide sidewalk on the east side of the Connecticut Avenue bridge over the CSX railroad tracks and a 12-foot wide shared use path on the west side of the of the bridge.

- Provide an eight-foot wide shared use path along the west side of Connecticut Avenue between Perry Avenue and Howard Avenue.

- Modify the lane striping along Connecticut Avenue, University Boulevard, and Summit Avenue to be consistent with the Maryland Manual on Uniform Traffic Control Devices. Do not extend normal striping through unsignalized intersections. Instead, use pavement marking that conveys the pedestrian's right-of-way to the driver. SHA should also identify appropriate locations for pedestrian actuated stop signals.

Bike and pedestrian facilties are discussed below.

Summit Avenue Extended

The Plan recommends extending Summit Avenue as a Business District Street with a 60-foot right-of-way and two travel lanes from Plyers Mill Road to Connecticut Avenue—Alterntavie A via Farragut Avenue or LAterntiave B via Dupont Avenue. Extending Summit Avenue is recommended to:

- provide an alternative to Connecticut Avenue for local or shorter trips thereby relieving congestion at the intersection of Connecticut Avenue and Plyers Mill Road.

- further enhance vehicular, pedestrian, and bicycle connections across the railroad tracks.

In addition to extending Summit Avenue, the following improvements are recommended:

- Provide eight-foot sidewalks on the Summit Avenue bridge when the bridge is reconstructed.

- Revise the lane striping along Summit Avenue to conform with the Maryland Manual on Uniform Traffic Control Devices to better guide drivers at un-signalized intersections in urban areas.

- Designate Summit Avenue from Howard Avenue to Knowles Avenue as a Business District Street with a 70-foot right-of-way.

The design, location, and operation of Summit Avenue's ultimate connection with Connecticut Avenue (via either Farragut Avenue or Dupont Avenue) will need to be studied before the improvement is programmed for construction. The study should also examine any potential of, and impact upon, other adjacent streets (e.g., Concord Street and Metropolitan Avenue). The eventual extension of Summit Avenue should be viewed as central to the overall effort to improve street connectivity.

Howard Avenue

West of Connecticut Avenue, the Plan designates Howard Avenue as a Business District Street with a 60-foot right-of-way with a design focus on pedestrian amenities to foster and complement the street activation that will result from the higher densities and mixed uses—especially near Connecticut Avenue.

The crossing of Connecticut Avenue should be given particular priority. At a minimum, it should feature a wide, well marked crosswalk. Consideration should also be given to a pedestrian activated crossing signal when Howard Avenue is improved and redevelopment occurs in the area adjacent to and near the intersection with Connecticut Avenue. The Plan also recommends an SHA signal warrant study.
East of Connecticut Avenue, the plan designates Howard Street as a Business District Street with a 70-foot right-of-way.

Lexington Street

The Plan recommends extending Lexington Street south to Metropolitan Avenue as a Business District Street with a 60-foot right-of-way. This section would be composed of one northbound-only travel lane intended to provide an alternative for westbound traffic on Plyers Mill to avoid the Metropolitan Avenue intersection.

Bicycle and Pedestrian System

Bicycle-Pedestrian Priority Area

As part of the Action Plan of the County Executive's 2008 Pedestrian Safety Initiative, the Planning Department agreed to consider designating areas as Bicycle-Pedestrian Priority Areas in master and sector plans. The designation of such areas was permitted under State Law as part of the Access 2000 legislation passed in 1995. No areas have yet been officially designated but both the proposed (2009) Germantown Master Plan and White Flint Sector Plan include such areas. Designation in Kensington would require the State to prioritize pedestrian and bicycle improvements in the area. The State must agree with the designation.

Montgomery County recently made changes to the Road Code in an effort to make our roads more pedestrian- and bicycle-friendly. The areas with the greatest concentration of pedestrians and bicyclists were designated as Urban. The Road Code applies only to County-maintained roads; Kensington was not designated as Urban because the Town and State maintain all the roads in the Town, which comprises most of the Sector Plan area.

Given the above, consideration of designating the Kensington Sector Plan area as a Bicycle Pedestrian Priority Area would be consistent with the Plan recommendations as a means of ensuring that appropriate pedestrian and bicycle accommodation is provided. Designation could provide a measure of consistency in an improved environment for bicyclists and pedestrians in both the majority of the Sector Plan area that is in the Town, as well as the small area outside the Town's boundaries. Designation of the Sector Plan area as a Bicycle-Pedestrian Priority Area would also support the Planning's Board's recommendations for bicycle-pedestrian improvements when commenting on the Mandatory Referral of projects on State highways within this area.

General Observations

The Town of Kensington has two types of street grids. South of the railroad tracks is a curvilinear grid that has good internal connections but fewer external connections. North of the tracks is a more standard rectangular grid. Both provide generally good pedestrian and bicyclist circulation.

There are three other small areas in the Plan boundaries:

- an area that extends the grid to the north
- the Ken-Gar neighborhood, which has pedestrian connections to Plyers Mill Road, Perry Avenue, and Rock Creek Trail
- the industrial area south of the tracks and west of Summit Avenue that has almost no cross streets.

The CSX tracks pose a significant barrier to pedestrian and bicyclist movement north and south. There are only three connections between the north and south sections of the Town—Summit Avenue, Connecticut Avenue, and the at-grade track crossing at Kensington Station. The first two are barely adequate; the at-grade track crossings are hazardous. The nearest crossings of the tracks outside the Plan area are Rock Creek Trail, almost a half-mile west of Summit Avenue, and Stoneybrook Drive, about 2/3 of a mile east.

In addition to the physical problems associated with crossing the CSX tracks, pedestrian accommodation along and across the major roads also needs improvement. A crosswalk was recently installed on Connecticut Avenue at Washington Street between the bus stops following a fatal pedestrian collision. Pedestrians have the right-of-way to cross at unsignalized intersections, i.e. drivers must stop for them, but the existing lane striping on Connecticut Avenue, University Boulevard, and Summit Avenue extends through un-signalized intersections, obscuring the intent of the law and adversely affecting pedestrian safety. This striping treatment is counter to the guidance in the Maryland Manual on Uniform Traffic Control Devices, which establishes national standards for signing and striping.

Intersection widening should be minimized to avoid adverse impacts on pedestrians and bicyclists. Traffic improvements should instead be achieved by adding to the grid network of streets and by creative operational improvements such as dynamic lane signalization on Connecticut Avenue.

Sidewalks along the major roads are generally located at the curbline, which places pedestrians in an undesirable location next to running traffic. In the two- to three-foot-wide area next to the curb, pedestrians can be struck by overhanging rear-view mirrors. Also, snow plowed from these wide roads can block the entire sidewalk, making it impassable for the handicapped and forcing pedestrians to walk in the roadway.

The bicycle network in Kensington, as recommended in the Countywide Bikeways Functional Master Plan (CBFMP), is a network of signed shared bikeways on lower-speed residential streets.

SHA's Bicycle Pedestrian Guidelines recommend bike lanes be provided on State highways with high speeds or high volumes. The State highways within the Plan boundaries, with approximate annual average daily traffic volumes (AADT) include:

- Connecticut Avenue (MD185): 56,000 AADT
- University Boulevard (MD193): 22,000 AADT
- Plyers Mill Road/Metropolitan Avenue (MD192): 9,200 AADT
- Knowles Avenue (MD547): 10,000 AADT

However, all of the State highways in Kensington are low-speed.

The traffic volumes on Connecticut Avenue and University Boulevard are high enough to warrant bike lanes, but the CBFMP does not show bike routes on either road, except for a short segment of shared use path between Plyers Mill Road and Howard Avenue on the east side of Connecticut Avenue. The existing curb-to-curb width on Connecticut Avenue and University Boulevard is 82 to 85 feet and their recommended rights-of-way is 120 feet. The difference between existing and the Sector-planned right-of-way is sufficient to provide on-road bike lanes and landscaped panels with street trees to separate sidewalks from the curb.

Lighting

Section 2-602 of the Annotated Code of Maryland states "Access to and use of transportation facilities by pedestrians and bicycle riders shall be considered and best engineering practices regarding the needs of bicycle riders and pedestrians shall be employed in all phases of transportation planning, including highway design, construction, reconstruction, and repair as well as expansion and improvement of transportation facilities."

Best engineering practices includes the provision of continuous lighting along roadways, sidewalks, and bicycle facilities in urban areas, such as Kensington.

Pedestrian Recommendations

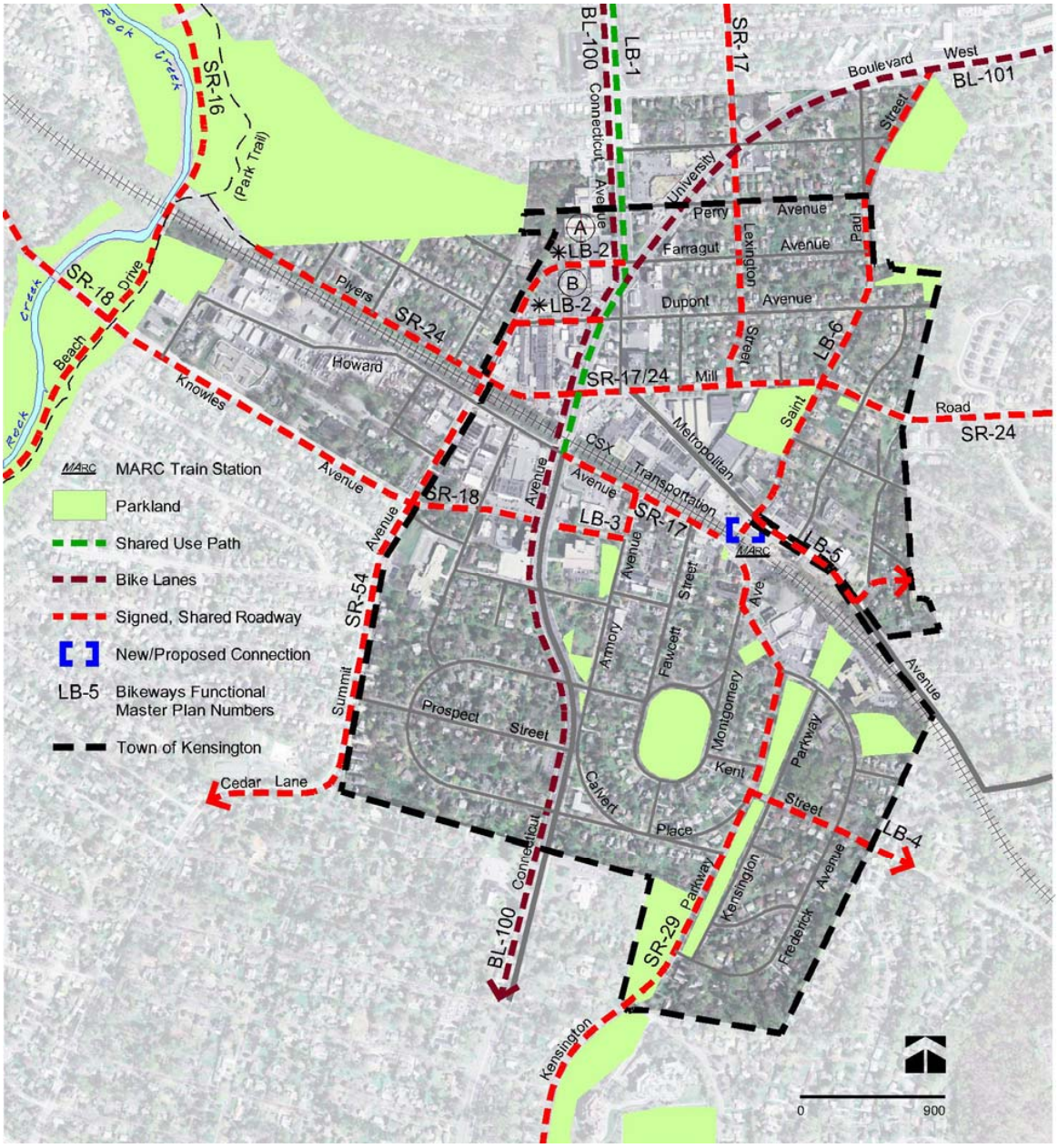
Specific concepts consistent with the Plan recommendations for improving pedestrian connectivity include the following.

Reconstruct sidewalks along major roads to have a five-foot-wide minimum landscaped panel with street trees between the curb and sidewalk or shared use path.

- Provide a sidewalk along the west side of Connecticut Avenue south of Washington Street.
- Identify safe, ADA-compliant crossings for each bus stop and consider the installation of crosswalks.
- Evaluate the adequacy of street lighting at all intersections, particularly at bus stops at or near un-signalized intersections.
- Revise the lane striping along Connecticut Avenue, University Boulevard, and Summit Avenue to be in conformance with the Maryland Manual on Uniform Traffic Control Devices, which recommends that a different pattern be used in special cases where additional guidance is needed for drivers.

- Provide eight-foot-wide sidewalks on the Summit Avenue Bridge over the CSX tracks when the bridge is reconstructed.
- Provide a pedestrian path along the southern boundary of the HOC headquarters to improve pedestrian connectivity between Summit Avenue and Detrick Avenue because no other route exists along the east side of Summit Avenue in the quarter-mile distance between Mitchell and Prospect Streets.
- Provide an eight-foot-wide sidewalk on the east side of the Connecticut Avenue Bridge over the CSX tracks and a twelve-foot-wide shared use path on the west side of the bridge.
- Provide a twelve-foot-wide (minimum) grade-separated crossing under the tracks to the east of the existing at-grade CSX track crossing at Kensington Station, generally in line with Wheatley Street.
- Make all intersections of Connecticut Avenue and University Boulevard with public streets ADA-compliant and provide pedestrian refuges in the median where the crossing distance exceeds sixty feet. Provide median pedestrian refuges at all intersections with divided roadways, including 'T' intersections. Where safe crossings cannot be provided, post signs prohibiting the crossing and directing pedestrians to the nearest safe crossing.
- The pedestrian crossing of the eastbound lanes of University Boulevard at Farragut Avenue is immediately north of a driveway to a property which has another driveway on University 200 feet away. The northern driveway should be closed improve the safety of this crosswalk and to allow its relocation about 25 feet south to achieve a safer crossing of University Boulevard.
- Provide continuous lighting along the Major Highways and Arterials and at intersections to meet AASHTO standards.

Map 7 Kensington Bicycle Network



The bicycle and pedestrian system recommendations for Kensington will be implemented through a combination of land use and zoning policies, local street network implementation, and pedestrian access and safety improvements

Pedestrian and Bicyclist Access and Safety

Pedestrian and bicyclist access and safety in the Kensington area will be pursued through several initiatives, including:

- design standards to implement the County's Road Code
- design guidelines for private sector development in the Plan area
- zoning requirements for bicycle parking and other amenities
- engineering, education, and enforcement programs under the County Executive's Pedestrian Safety Initiative.

In 2007, the County Council adopted several amendments to Chapter 49 of the County Code concerning streets and roads to improve pedestrian and bicycle accommodation, stormwater management, and context-sensitive design. In December 2008, the Council approved Executive Regulation 31-08 AM, Context Sensitive Road Design Standards, which specify certain design standards and processes for implementing the revised road construction code, most notably typical cross section standards, required stormwater management criteria for capturing runoff within the right-of-way, and considerations for establishing target speeds and street tree placement. Continued effort is needed to complete the Road Code's range of street design and intersection design standards that will promote pedestrian and bicyclist access and safety.

The Planning Board will adopt design guidelines for the Plan area that will guide development to improve pedestrian access, comfort and safety, including:

- building orientation to maximize pedestrian accessibility
- street tree planting
- design treatments for sidewalks and driveways
- street lighting
- signing and marking.

The Plan proposes the CR Zone for much of the Kensington area. This zone is designed to facilitate pedestrian use, access and safety by requiring:

- pedestrian-oriented activity at street level with uses such as storefront retail and restaurants
- safety-oriented environmental design including clearly marked sidewalks and crosswalks
- street trees providing canopy and landscaping on all streets, including street furniture such as benches, trash receptacles, and planters
- continuous, direct, and convenient connections to transit stations for pedestrians and bicyclists.

As public and private sector projects are implemented, all agencies need to elevate pedestrian and bicycle access and safety considerations in their review of design and operational elements, including:

- maximum curb radii of 30 feet
- signal timing should be evaluated periodically to insure that pedestrians are adequately accommodated
- maximum crosswalk lengths of 60 feet between pedestrian refuges
- accessible bus stop locations at or near marked crosswalks
- signing and marking per the Maryland Manual on Uniform Traffic Control Devices, including marked crosswalks at all approaches to signalized intersections and elimination of lane markings across unsignalized intersections

- street lighting designed to improve the visibility of pedestrians at levels specified by the Illuminating Engineering Society of North America
- design of mixed-use streets and pedestrian walkways and alleys using Crime Prevention Through Environmental Design criteria.

Transportation-Land Use Balance

The Kensington Sector Plan transportation analyses reflect the procedural guidance established by the County Council's Growth Policy.

Measures of Effectiveness

The analysis of plan development and potential impact upon the transportation network considers three levels of transportation analysis:

- an area wide mobility analysis that indicates the degree to which any particular local land use and transportation scenario provides an appropriate balance between land use and transportation network per current County policies.
- an intersection congestion analysis that indicates the degree to which the Plan's land use and transportation network affects congestion hot-spots within the Kensington area
- a cordon line analysis demonstrating the relative amount of through traffic vs. local traffic.

The first two measures are elements of the County's Growth Policy, called Policy Area Mobility Review (PAMR) and Local Area Transportation Review (LATR), summarized below. Detailed background information on these two analyses as applied under current policy is available on the Department's website, www.MontgomeryPlanning.org.

Policy Area Mobility Review

Since the early 1980s, every master plan has considered the balance between land use and transportation using an assessment of area wide conditions forecast for the plan's end-state conditions. PAMR is the current measure of area wide transportation adequacy, introduced into the County Growth Policy in 2007. It is similar in nature to the Policy Area Transportation Review measure that was an element of the Growth Policy from 1982 to 2003.

PAMR is used to implement the Adequate Public Facilities Ordinance (APFO) to forecast conditions by considering the County's pipeline of approved development and near-term transportation system improvements for which funding is committed during the next four years.

PAMR continues the County's long-standing policy that higher levels of roadway congestion are appropriate in areas with higher quality transit service. This provides multi-modal equity across the County and promotes the development of pedestrian-oriented, rather than auto-oriented, improvements in Metro Station Policy Areas.

Through PAMR, the County Council has established transit and arterial level of service (LOS) standards for each policy area by considering area wide adequacy on two scales relative transit mobility and relative arterial mobility.

Relative transit mobility is based on the Transit/Auto Travel Time level of service concept in the Transportation Research Board's 2003 Transit Capacity and Quality of Service Manual published by the. It is defined as the relative speed by which journey to work trips can be made by transit, as opposed to by auto. This concept assigns letter grades to various levels of transit service, so that LOS A conditions exist for transit when a trip can be made more quickly by transit (including walk-access/drive-access and wait times) than by single-occupant auto. This LOS A condition exists in the Washington region for certain rail transit trips with short walk times at both ends of the trip and some bus trips in HOV corridors. LOS F conditions exist when a trip takes more than an hour longer to make by transit than by single-occupant auto.

Relative arterial mobility measures congestion on the County's arterial roadway network based on the urban street delay level of service in the Tranportation Research Board's 2000 Highway Capacity Manual. It measures congestion by comparing modeled congested speeds to free-flow speeds on arterial roadways. It then assigns letter grades to the various levels of roadway congestion, with letter A assigned to the best levels of service and letter F assigned to the worst levels of service. For a trip along an urban street that has a free-flow speed (generally akin to posted speed) of 40 miles per hour, LOS A conditions exist when the actual travel speed is at least 34 miles per hour, including delays experienced at traffic signals. At the other end of the spectrum, LOS F conditions exist when the actual travel speed is below 10 miles per hour.

The Kensington Sector Plan area is located within the Kensington/Wheaton Policy Area. Table 6 shows the forecast Policy Area Mobility Review conditions for all Policy Areas in the County for 2030 assuming the Plan's "high" scenario. Figure 7 summarizes the supporting travel data, including vehicle miles of travel (VMT) and vehicle hours of travel (VHT) for both free-flow and congested conditions. Given the assumptions of the "high" scenario, the Kensington/Wheaton Policy Area is forecast to operate at:

- Relative Transit Mobility of 85 percent (LOS E – between 75 and 100 percent)
- Relative Arterial Mobility of 42 percent (LOS D – between 40 and 55 percent).

The current Growth Policy requires that all Policy Areas have a relative arterial mobility of at least 40 percent, or LOS D conditions, regardless of the level of transit service provided. The PAMR results meet this threshold and from a policy perspective, the Plan can be considered to be in balance.

Table 6 2030 PAMR Forecast—Kensington

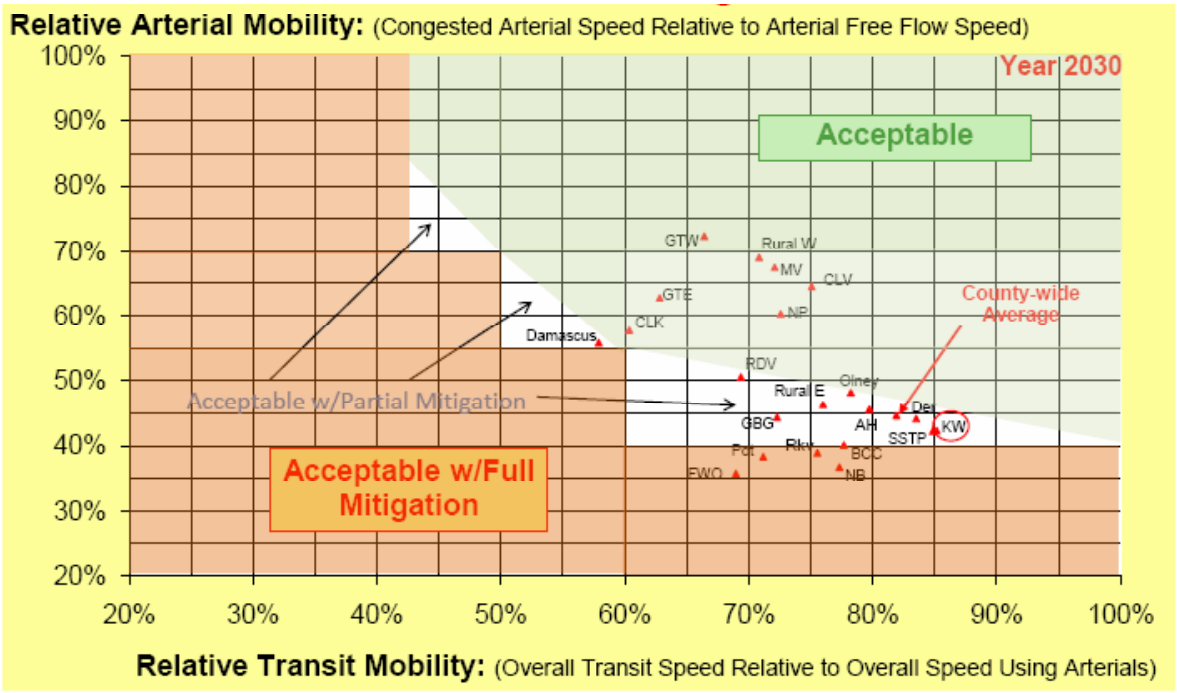


Table 7 Policy Area Mobility Review—2030

Derivation of Year 2030 PAMR Results by Policy Area - Kensington Sector Plan

						Relative Arterial Mobility			Relative Transit Mobility
Policy Area	VMT	VHT (free-flow)	VHT (congested)	Free-Flow Speeds	Congested Speeds	Relative Arterial Mobility	Average Arterial Travel Time	Average Transit Travel Time	Relative Transit Mobility
Aspen Hill	192,405	5,874	12,882	32.8	14.9	46%	41.2	51.7	80%
Bethesda/Chevy Chase	399,731	15,688	39,110	25.5	10.2	40%	30.9	39.8	78%
Clarksburg	110,128	3,673	6,359	30.0	17.3	58%	38.1	63.2	60%
Cloverly	98,412	2,442	3,782	40.3	26.0	65%	44.1	58.8	75%
Damascus	92,166	2,284	4,093	40.4	22.5	56%	48.1	83.0	58%
Derwood/Shady Grove	142,859	5,086	11,518	28.1	12.4	44%	37.8	45.3	83%
Fairland/White Oak	389,527	10,282	28,736	37.9	13.6	36%	39.9	57.8	69%
Gaithersburg City	235,077	8,387	18,902	28.0	12.4	44%	35.1	48.6	72%
Germantown East	107,695	3,641	5,797	29.6	18.6	63%	36.8	58.5	63%
Germantown West	149,752	4,905	6,776	30.5	22.1	72%	37.3	56.1	66%
Kensington/Wheaton	478,759	15,069	35,598	31.8	13.4	42%	37.2	43.7	85%
Montgomery Village/Airpark	146,004	4,837	7,165	30.2	20.4	68%	41.6	57.7	72%
North Bethesda	255,117	11,282	30,693	22.6	8.3	37%	29.2	37.7	77%
North Potomac	65,971	2,364	3,919	27.9	16.8	60%	40.8	56.3	72%
Olney	170,857	4,844	10,047	35.3	17.0	48%	47.4	60.6	78%
Potomac	204,413	6,132	15,988	33.3	12.8	38%	38.4	53.9	71%
R & D Village	66,569	2,958	5,847	22.5	11.4	51%	32.0	46.1	69%
Rockville City	277,881	12,025	30,870	23.1	9.0	39%	31.9	42.3	75%
Silver Spring/Takoma Park	277,475	10,616	25,145	26.1	11.0	42%	33.3	39.3	85%
Rural East	612,620	15,620	33,717	39.2	18.2	46%	47.1	62.0	76%
Rural West	244,374	6,640	9,618	36.8	25.4	69%	47.8	67.4	71%
Montgomery County Total	**4,717,792**	**154,649**	**346,562**	**30.5**	**13.6**	**45%**	**37.9**	**46.3**	**82%**

Relative Arterial Mobility measures total PM Peak Period vehicular travel on arterial roadways within each policy area
Relative Transit Mobility measures AM Peak Period travel times for journey-to-work trips originating within each policy area
VMT = Vehicle Miles of Travel
VHT = Vehicle Hours of Travel

The assessment of Policy Area conditions in Tables 6 and 7 reflect the upper bound of the demographic scenarios tested for Kensington in combination with Round 7.1 demographic forecasts for all other areas in the Washington metropolitan region. Therefore, while the exhibits are appropriately labeled with a horizon year of 2030, staff does not expect that the full plan yield for any of the Policy Areas will be achieved by the year 2030.

The Plan also recognizes Kensington's proximity to White Flint and the Wheaton CBD. For that reason, an additional 22,000 employees and 8,000 households above the 2030 Round 7.1 Cooperative Forecast were assumed for future development located within the White Flint Sector Plan area—reflecting the Plan's land use recommendations. When this Plan and Appendix were written, the Wheaton CBD Plan was not as far along as White Flint. As a result, future development in the Wheaton area reflected the 2030 Round 7.1 Cooperative Forecast. The difference in trips generated within the Plan area is compared later in this Appendix and shown in Table 11.

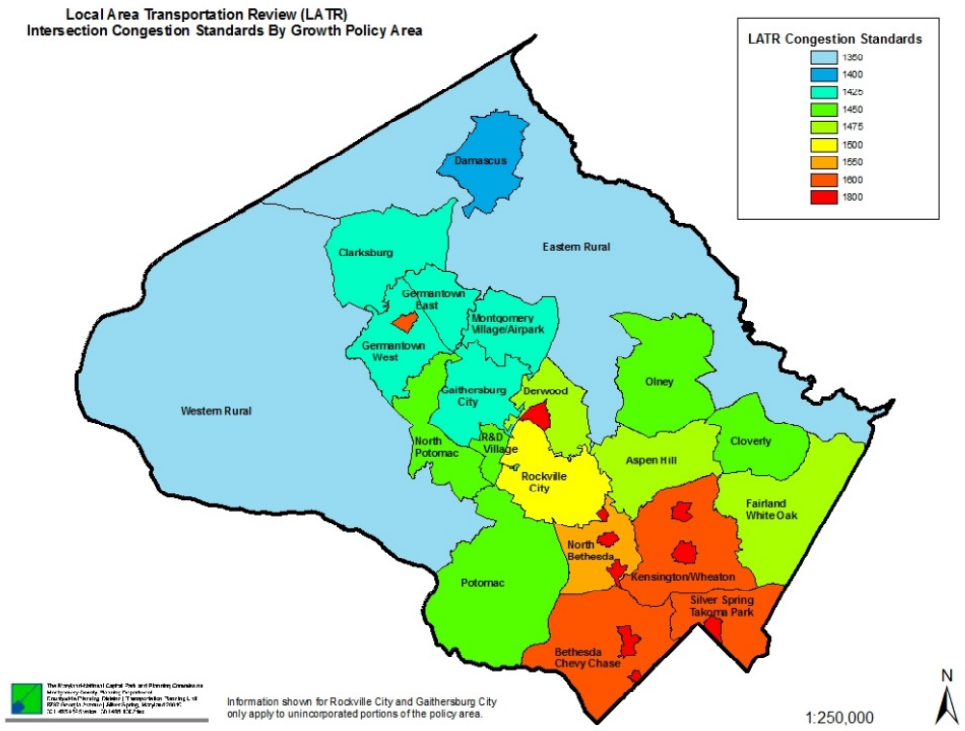
Local Area Transportation Review (LATR)

The Kensington Sector Plan supports redevelopment into a transit-oriented community with an emphasis on pedestrian accessibility, connectivity, and safety.

The intersection analysis conducted as part of the Plan applies the Critical Lane Volume (CLV) methodology from the Planning Department's Local Area Transportation Review (LATR) guidelines. The CLV values are converted to a volume-to-capacity measurement, or V/C ratio, by dividing the current or forecasted CLV values by the applicable congestion standard.

As shown in Map 8, the County's Growth Policy establishes acceptable levels of congestion for different policy areas based on the degree to which alternative modes of transportation are available. In rural policy areas, where few alternatives to auto transport exist, the congestion standard is 1,350 CLV (which equates to the middle range of LOS D). In Metro Station Policy Areas, where multiple alternatives to auto transport are provided, the congestion standard is 1,800. Currently, intersections in the Kensington area as part of the Wheaton/Kensington Policy Area have a congestion standard of 1,600 CLV.

Map 8 Intersection Congestion Standards by Policy Area



Map 8 and Table 9 summarize the congested intersections under both existing conditions and the land use scenario tested for the draft Plan. Findings follow.

- While not reflected in the table, the intersection of Connecticut Avenue and Plyers Mill Road is the fourth most congested in the County with a current CLV of 1,875—above the Policy Area standard of 1,600.
- The intersection of Connecticut Avenue and Plyers Mill Road would experience an estimated CLV of 1,937 in 2030 if Summit Avenue were to be extended. The CLV without the extension is estimated to be over 2,200.

- The introduction of dynamic lane assignment in the evening peak period—along with the extension of Summit Avenue—could potentially reduce the CLV to an estimated 1,707—slightly below the existing level.

Table 8 Intersection Analysis with Summit Avenue Extension

Node No.	Intersection Name	Existing			2030 LU, Existing Roads Without Summit Ave Extended			2030 LU, Existing Roads With Summit Ave Extended		
		AM	PM	V/C	AM	PM	V/C	AM	PM	V/C
171	Lexington St-Newport Rd/University Blvd	715	774	0.48	834	858	0.54	831	867	0.54
172	Connecticut Ave/University Blvd	1,335	974	0.83	1,508	1,137	0.94	1,355	1,012	0.85
173	Connecticut Ave/Plyers Mill Rd	1,304	1,825	1.14	1,737	2,240	1.40	1,591	1,937	1.21
174	Connecticut Ave/Knowles Ave	1,433	1,274	0.90	1,753	1,557	1.10	1,665	1,489	1.04
175	Summit Ave/Knowles Ave	1,167	1,005	0.73	1,412	1,393	0.88	1,355	1,405	0.88
674	Connecticut Ave/Perry Ave-Kaiser Permanente Drwy	1,191	1,022	0.74	1,401	1,172	0.88	1,411	1,330	0.88
720	Plyers Mill Rd/Concord ST-Metropolitan Ave	687	866	0.54	893	1,265	0.79	1,193	1,403	0.88
737	Connecticut Ave/Washington St	1,034	819	0.65	1,205	924	0.75	1,205	925	0.75
900	Connecticut Ave/Howard Ave	n/a	n/a	0.00	1,571	1,551	0.98	1,434	1,364	0.90

Table 9 Intersection Analysis with Summit Avenue Extension and Dynamic Lane Assignment at Connecticut Avenue Southbound to EB Plyers Mill Road

Node No.	Intersection Name	Existing			2030 LU, Existing Roads Without Summit Ave Extended			2030 LU, Existing Roads With Summit Ave Extended & Dynamic Lane Assignment		
		AM	PM	V/C	AM	PM	V/C	AM	PM	V/C
171	Lexington St-Newport Rd/University Blvd	715	774	0.48	834	858	0.54	831	867	0.54
172	Connecticut Ave/University Blvd	1,335	974	0.83	1,508	1,137	0.94	1,355	1,012	0.85
173	Connecticut Ave/Plyers Mill Rd	1,304	1,825	1.14	1,737	2,240	1.40	1,581	1,707	1.07
174	Connecticut Ave/Knowles Ave	1,433	1,274	0.90	1,753	1,557	1.10	1,665	1,489	1.04
175	Summit Ave/Knowles Ave	1,167	1,005	0.73	1,412	1,393	0.88	1,355	1,405	0.88
674	Connecticut Ave/Perry Ave-Kaiser Permanente Drwy	1,191	1,022	0.74	1,401	1,172	0.88	1,411	1,330	0.88
720	Plyers Mill Rd/Concord ST-Metropolitan Ave	687	866	0.54	893	1,265	0.79	1,193	1,403	0.88
737	Connecticut Ave/Washington St	1,034	819	0.65	1,205	924	0.75	1,205	925	0.75
900	Connecticut Ave/Howard Ave	n/a	n/a	0.00	1,571	1,551	0.98	1,434	1,364	0.90

Cordon Line Analysis

The cordon line analysis measures total traffic volumes entering or leaving an area.

Vehicular Traffic Volumes

Table 10 compares existing and forecast traffic volumes at the studied cordon line. In general, the cordon line serves as the boundary between the Kensington Plan area, where land uses are proposed to change as a result of this Plan, and elsewhere in the County, which is subject to other plans and/or is otherwise not forecast to change development densities from this Plan.

At the cordon line, the total traffic volume will increase by about 35 percent, from 132,000 vehicles per day to 177,000 vehicles per day. The heaviest volumes will occur on the Connecticut Avenue south of the Plan area, with more than 51,000 vehicles per day.

Table 10 Cordon Line Traffic Volumes

Location	ADT	AM Peak Hour Inbound	AM Peak Hour Outbound	AM Peak Hour Total	PM Peak Hour Inbound	PM Peak Hour Outbound	PM Peak Hour Total
121 CONNECTICUT N	36600	2592	656	3248	867	2103	2970
122 UNIVERSITY	19900	987	410	1397	690	1293	1983
123 PLYERS MILL	7000	356	159	515	261	410	671
124 METROPOLITAN	9200	224	522	746	508	314	822
125 KENSINGTON Pkwy	7100	*200*	*400*	600	*400*	*200*	600
126 CONNECTICUT S	40600	717	2736	3453	2112	1339	3451
127 SUMMIT	11200	263	664	927	715	257	972
128 KNOWLES	10200	516	324	840	447	447	894
TOTAL	131600	5855	5871	11726	6000	6363	12363

2030 Conditions - Scenario K - Peak Hour Totals

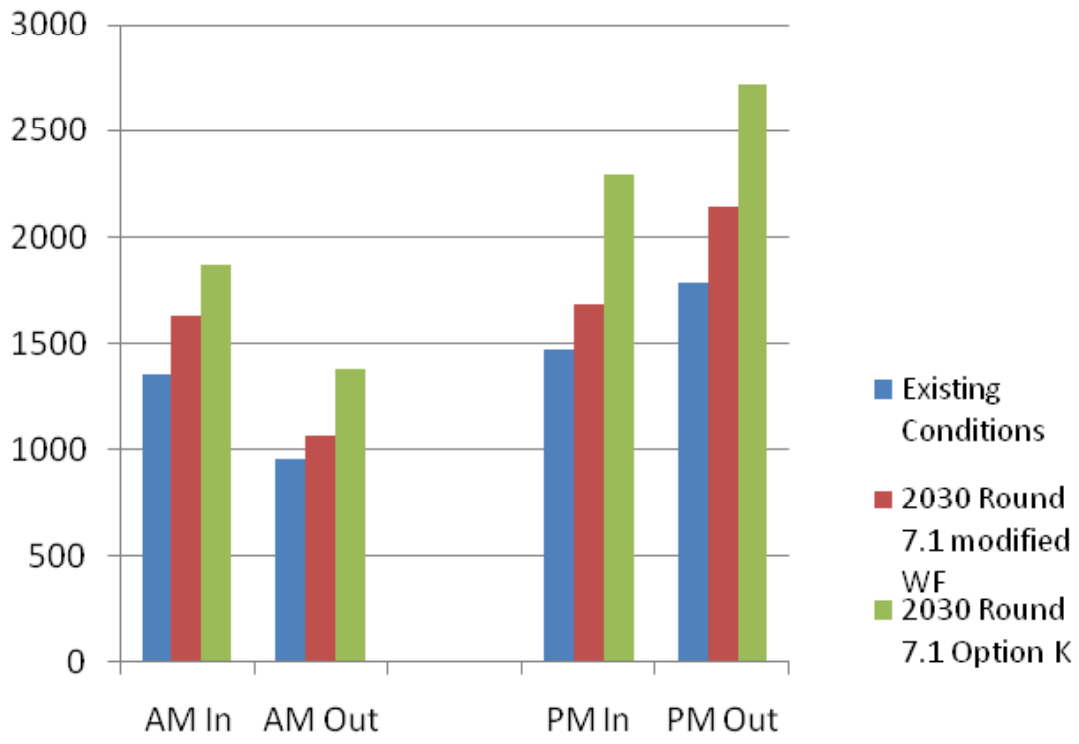
121 CONNECTICUT N	43200	2930	740	3670	1070	2600	3670
122 UNIVERSITY	28200	1690	700	2390	830	1560	2390
123 PLYERS MILL	7600	450	200	650	250	390	640
124 METROPOLITAN	13400	340	800	1140	700	440	1140
125 KENSINGTON Pkwy	7100	200	400	600	400	200	600
126 CONNECTICUT S	51500	910	3470	4380	2680	1700	4380
127 SUMMIT	15200	370	930	1300	950	340	1290
128 KNOWLES	11100	580	360	940	470	470	940
TOTAL	177300	7470	7600	15070	7350	7700	15050

The traffic volumes are highest during the evening peak hour when the total traffic entering or leaving Kensington is about 12,400 vehicles, of which about 30 percent is going to or from Kensington and about 70 percent is through traffic. Under the Plan's recommended development scenario (Option K), the locally generated traffic would increase by about 50 percent and the through traffic would increase by about three percent. The relative lack of through traffic growth is influenced in part by the amount of development proposed for Kensington. As local development increases, the likelihood that someone living or working in White Flint or Wheaton would travel to Kensington, as opposed to through Kensington, also increases.

Draft Plan Trip Comparison

The Plan's transportation infrastructure recommendations are based on a comparison of the peak hour trips generated within the Plan area under existing conditions, under 2030 Round 7.1 forecasts modified to reflect the proposed (2009) White Flint Plan's recommendations, and under an Option K that reflects the Plan's recommended development. The increase attributable to the propsed White Flint Plan is shown in Table 11.

Table 11 Draft Plan Trip Generation Comparison



Travel Demand Forecasting Process and Assumptions

The travel demand forecasting process uses three levels of analysis: a regional travel demand model, a cordon line analysis, and an intersection analysis.

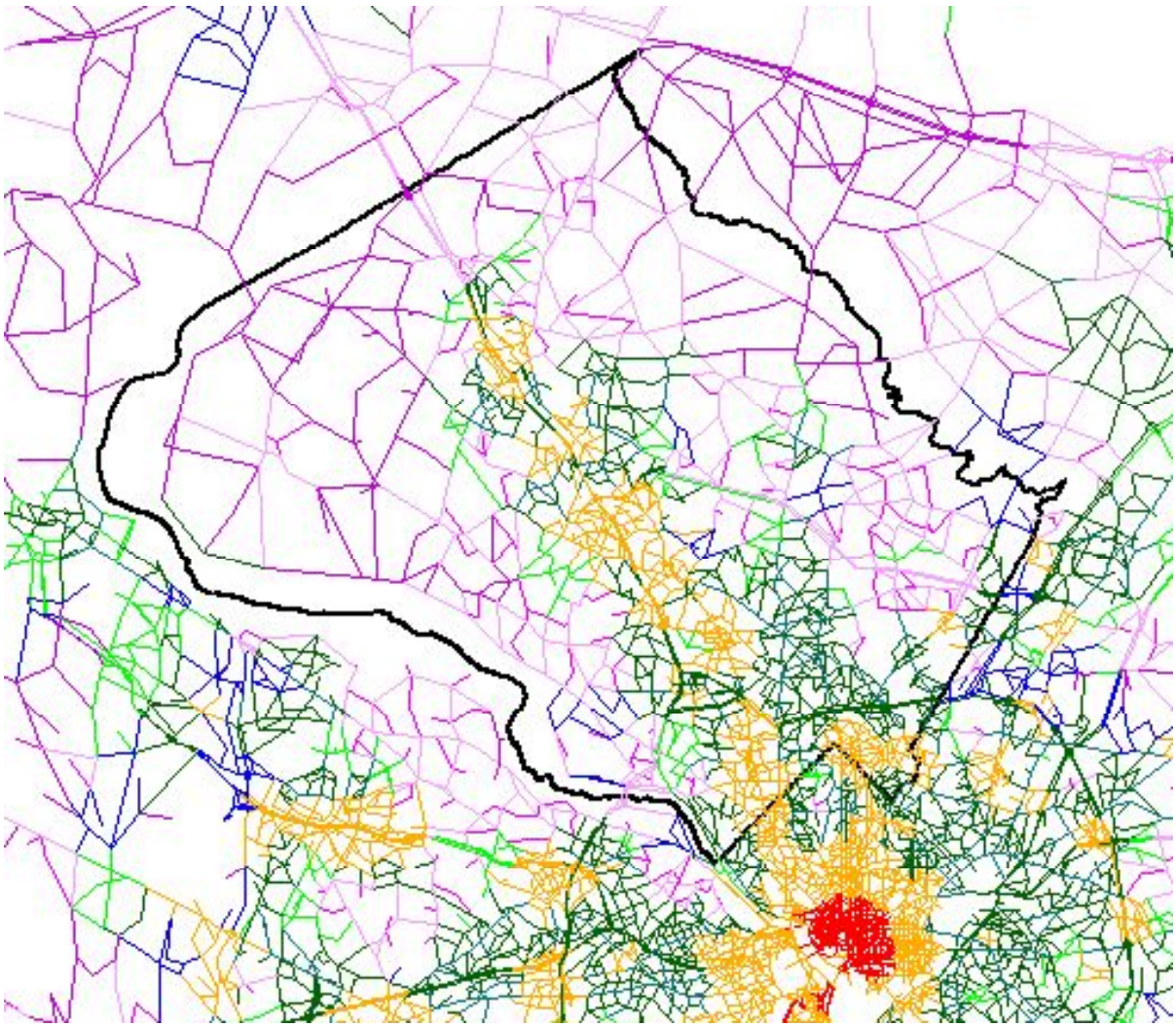
The Department's regional travel demand forecasting model, TRAVEL/3, is used to develop forecast travel demand results for weekday travel and evening peak periods.

TRAVEL/3 is a four-step model, consisting of:

- trip generation: the number of person trips that are generated by given types and densities of land uses within each Transportation Analysis Zone (TAZ)
- trip distribution: how many person trips generated by each TAZ will travel to each of the other TAZs within the Washington metropolitan area
- mode split: which mode of travel the person trips will use, including single-occupant auto, multiple-occupant auto, transit, or a non-motorized mode such as walking or bicycling
- traffic assignment: the roadways that will be used for vehicular travel between TAZs.

The TRAVEL/3 model incorporates land use and transportation assumptions for the metropolitan Washington region, using the same algorithms as applied by the Metropolitan Washington Council of Governments (MWCOG) for air quality conformity analysis. Figure 13 shows the relationship of Montgomery County in the regional travel demand network, featuring the coding of street network characteristics to reflect the general level of adjacent development density.

Map 9 Travel Forecasting Network



TRAVEL/3 provides system-level results that are used directly to obtain PAMR forecasts for the County's Policy Area Transportation Review. The system-level results are also used as inputs to the finer grain analytic tools described below.

The second level of analysis consists of post processing techniques applied to the TRAVEL/3 forecasts, as described in National Cooperative Highway Research Program Report 255. These techniques include refining the morning and evening peak hour forecasts to reflect a finer grain of land use and network assumptions than included in the regional model, such as the location of local streets and localized travel demand management assumptions. The NCHRP 255 analyses are used to produce the cordon line analyses.

The third level of analysis includes intersection congestion, using the Critical Lane Volume (CLV) methodology described in the Department's Policy Area Mobility Review/Local Area Transportation Review (PAMR/LATR).Guidelines

Travel/3 Forecasting Assumptions

The Kensington Sector Plan forecasts assumed the following background parameters:

- A 2030 horizon year. This is currently the most distant horizon year for which forecast land use and transportation network development is available.

- Regional growth per the MWCOG Cooperative Forecasting Process, using the most current round of Cooperative Forecasts.

- For the Washington region, the Round 7.1 forecasts include an increase from 3.0 million jobs and 1.9 million households in 2005 to 4.2 million jobs and 2.5 million households in 2030.

- For Montgomery County, the Round 7.1 forecasts include an increase from 500,000 employees and 347,000 households in 2005 to 670,000 employees and 441,300 households in 2030. An additional 22,000 employees and 8,000 households above the Round 7.1 forecast was assumed for development located within the White Flint Sector Plan area—reflecting that Plan's current land use recommendations.

- Transportation improvements in the region's Constrained Long Range Plan (CLRP), a fiscally constrained transportation network. Notable projects assumed to be in place for the buildout of the Kensington Plan include:
    - eliminating the WMATA turnback at Grosvenor
    - the Purple Line between Bethesda and Silver Spring
    - the Montrose Parkway East and the CSX grade separation
    - the Intercounty Connector
    - express toll lanes on I-270 from I-370 to the City of Frederick

Local Area Modeling Process and Assumptions

The Department's Local Area Modeling (LAM) process uses NCHRP Report 255 techniques to both convert the TRAVEL/3 system level forecasts to intersection-level forecasts. The LAM process is then used as a pivot-point technique to reflect changes to the localized land use or transportation network, providing both cordon line and network analysis results.

The TRAVEL/3 model represents the Kensington Plan and surrounding Area as six TAZs. The Kensington LAM disaggregates the area within the plan overlapping these six TAZs into 10 subzones based on block groupings separated by major roads within the Plan area boundary.

The LAM process uses trip generation rates that are customized to reflect both existing conditions and future changes, considering both the land use types and changes in travel behavior. Figure 14 shows the trip generation rates used in the LAM

Table 12 Local Area Model Peak Hour Trip Generation Rates

Land Use	Units	AM	PM
Office (at 30% NADMS)	1000 Square Feet	1.50	1.50
Retail (at 30% NADMS)	1000 Square Feet	0.50	2.00
Industrial (at 30% NADMS)	1000 Square Feet	1.10	1.10
Other Commercial(at 30% NADMS)	1000 Square Feet	1.30	1.30

These trip generation rates reflect a combination of Local Area Transportation Review rates for development similar to that envisioned for Kensington and were calibrated to match the observed traffic counts, considering the amount of through traffic in the roadway network so that the LAM volumes at the network cordon line are within two percent of observed count data for both morning and evening peak hours.

The trip generation rates shown in Figure 14 are generally lower than those found in the Institute of Transportation Engineers (ITE) trip generation report, particularly for commercial land uses. The rates reflect the fact that ITE rates for most commercial locations do not have the transit availability and usage found in Kensington. The difference for residential uses is not quite as high because ITE multifamily trip generation rates do reflect the fact that most multifamily housing units have, almost by definition, sufficient density to support transit service. Finally, the retail trip generation rates in the Kensington zones also incorporate a discount for pass-by trips in which the primary origin and destination are elsewhere and for diverted trips that have an origin and destination elsewhere and during which drivers changes their primary routes.

Land Use Alternatives Tested

Table 13 shows the Kensington Policy Area land use alternatives considered for the LAM in the development of the Kensington Sector Plan.

Table 13 Kensington Policy Area Land Use Scenarios

Scenario	Commercial SF	DU
Existing	1.7m	950
1990 Plan–Low Scenario	2.1m	950
2009 Draft Plan Option K	2.5m	1,500